Nutrition News

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# NUTRITION AND HEART DISEASE

By JOHN W. GOFMAN, M.D., Ph.D.
Division of Medical Physics
Donner Laboratory, University
of California

Interest in the relationship of nutrition to heart disease rightfully is focussed upon the problem of coronary artery heart disease. Most students agree that coronary heart disease is a consequence, in general, of excessive atherosclerosis of the relatively large branches of the coronary arterial tree. The derived problem involves possible relationships between nutrition and coronary artery atherosclerosis.

In a broad sense, our interest extends to any and all possible effects nutrition may have upon the integrity of the artery and upon its susceptibility to atherosclerosis and intra-arterial thrombosis. Knowledge of such possible broad relationships is still primitive. One specific lead, being actively explored by investigators throughout the world, is the reasonably well documented relationship demonstrated to exist between certain circulating blood lipids and the development of coronary artery atherosclerosis. The concept receiving attention holds that elevation in the serum level of the implicated lipids is associated with accelerated progression of atherosclerosis. The nutritional problem is to determine what role nutrition plays in the control of serum lipid levels, regardless of how the serum lipids are described.

In this area of investigation certain empirical observations concerning the role of nutrition in the determination of human serum lipid levels have been made. These are (a) that there exists a moderate statistical association of overweight with elevated serum lipid levels, (b) that the correction of overweight in some individuals with high serum lipid levels is associated with a lowering of such elevated levels, and (c) that restriction of vegetable plus animal fat is associated with a lowering of serum lipid levels in part of the human population.

The seriousness of the problem of coronary artery atherosclerosis has led to immediate efforts to apply the empirical observations described above to the problem of control of coronary atherosclerosis. The result has not been a happy one, for there has been gross distortion and misunderstanding of the empirical observations themselves and of their implications.

While there is no question of the existence of a statistical relationship between overweight and elevation of certain serum lipids (measured in a centrifuge as lipoproteins), it is of great importance to realize that the magnitude of the correlation actually is low. Many overweight individuals are found to have low serum lipoprotein levels. Many normal or underweight individuals have high serum lipoprotein levels. From this it is apparent that overweight resulting from overnutrition may be contributory to elevation in serum lipoprotein levels but overweight cannot be regarded as a general causative factor in production of elevated serum lipoprotein levels.

Some overweight individuals with elevated serum lipoproteins experience marked reduction in lipoprotein levels during weight reduction and maintain part of this lipoprotein reduction once weight has become steady at lower than original weight. Others, however, will be affected very little, if at all, by a similar degree of weight loss. No explanation yet is available for the observed individual variability in serum lipoprotein response to caloric restriction in food intake.

From the evidence it must be recognized that correction of overweight by caloric restriction cannot be regarded as a universal approach to prevention of atherosclerosis, even though potentially of inestimable value in individual cases.

Similar considerations apply to fat restriction in the diet. In selected individuals, dietary restriction produces appreciable lowering of serum lipoprotein levels. In others, virtually no response to fat restriction is observed. Thus dietary fat intake cannot be regarded as a general *causative* agent in elevation of serum lipoprotein levels.

*Dr. Gofman*

Intelligent use of caloric restriction and/or fat restriction to reduce serum lipoprotein levels demands that the response of the individual patient to such restriction be determined. Widespread utilization of such measures without such determination of biochemical response will lead to disillusionment and to needless restriction of the diet for a large number of individuals.

The greatest prospects for control of atherosclerosis through control of serum lipoprotein level lies in intimate understanding of the basis for individual variability in lipoprotein response to dietary fat and dietary calories.

Since many individuals can maintain low serum lipoprotein levels with a high fat, high calorie intake, it is evident that biochemical mechanisms do exist in these individuals for handling such diets with no deleterious consequences. The rational long-term approach would be toward improvement of such biochemical mechanisms in those individuals in whom they are inadequate. It may indeed develop that nutrition itself is of vital importance in maintenance of a physiology efficient with respect to control of serum lipoprotein levels and atherosclerosis.

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# Glances AT NUTRITION RESEARCH

**Scientific effort is being concentrated on investigations of the role food plays in our present high incidence of heart disease. The problem remains unsolved. However, investigation is leading to better understanding of the nutritional aspects of the problem.**

**Dietary Cholesterol**—Even high levels of dietary cholesterol do not influence blood serum levels of this substance for more than a brief period of time. Ten grams of cholesterol were given to 73 healthy men with breakfast of toast, butter, scrambled eggs, coffee, and cream. Serum cholesterol rose to a peak within four hours following administration of this massive dose, returning to normal within twenty-four hours. The mean serum rise was only about 4 mg. per 100 ml. — less than 3 percent of the total cholesterol which was consumed.

*—J. Mt. Sinai Hospital 20 :118 (July-Aug.) 1953.*

**Diet and Heart Disease**—Reduced incidence of heart disease in Norway during World War II was found to be associated with a reduced fat and caloric intake. There was little difference in cholesterol consumption between the pre-war years and war years.

*—Scand. J. Clin. Lab. Investig. 4 :122. 1952.*

**Human Fat**—The density of extracted human fat is essentially constant at 0.9000 gm./cc. at 37°C.

*—J. Applied Physiology 6 :252 (Oct.) 1953.*

**Dietary Fat**—It is possible to greatly reduce present high fat consumption in the United States without affecting consumption of nutritionally valuable foodstuffs such as milk, other dairy foods, meats, eggs et cetera. This can be done by simply reducing intake of cooking and salad fats and oils—which account for almost one-half of the total fats in our national food supply. By contrast butter contributes only one-twentieth of our total fat calories.

*—Am. J. Public Health 43 :1399 (Nov.) 1953.*

**Milk and Meat** — Too much attention has been focused on milk and meat as dietary sources of cholesterol. This conclusion was drawn following analysis of the cholesterol content of foods in Norway. Animal fat and milk are found to be low in cholesterol content when cholesterol-containing foods are compared on a caloric basis.

*—Scand. J. Clin. Lab. Investig. 4 :115. 1952.*

**Pantothenic Acid in Foods** — Nonfat milk solids contain 35 mcg. of pantothenic acid per gram while liver contains 70 mcg./gm. and fruits thus far tested contain less than 5 mcg./gm.

*—Agricultural Research 2 :7 (Jan.) 1954.*

### Dr. Gofman

Since 1947 Dr. Gofman has been associate professor of medical physics and clinical instructor in medicine at the University of California. His combined training and accomplishment in both areas is unique. In chemistry, he holds A.B. from Oberlin College, Ph.D. from University of California, with noted work in nuclear chemistry. After a year as section leader of the Plutonium Project, he continued medical study, taking M.D. and internship at California Medical School. Dr. Gofman is a fellow of the American Association for Advancement of Science and member of many honorary societies.

### NRC

The National Research Council is a cooperative organization of scientific men and women of America, including representation in engineering and industry and in the basic sciences upon which the applications of science depend. The Council was first established at the request of the President of the United States, by the National Academy of Sciences, to coordinate the research facilities for work on military problems involving scientific knowledge. In 1918, it was reorganized as a permanent body for the general encouragement of scientific research. It is supported by gifts, endowments, and by contracts.

### Efficiency

The year 1953 saw one milk cow to each seven persons in the United States, the second smallest number of milk cows in 30 years, *but* milk production per cow broke the record with an average slightly over 2500 quarts of milk per cow and two percent higher than the previous high in 1952.

## RESEARCH GOES INTO ACTION

*By Pattric Ruth O'Keefe, Ph.D., Director of Health and Physical Education Public Schools, Kansas City, Missouri*

Research can be alive, enjoyable and meaningful to boys and girls, particularly when they are the researchers as well as the benefactors. This is the experience of sixth and seventh grade boys and girls in public schools of Kansas City, Missouri.

Parents, children, and school personnel went into action to study the food habits of sixth and seventh grade children. To know their total food habits, a seven-day food appraisal was made. A standardized nutrition knowledge test also was given. This exploratory phase was to furnish basic data for changing and improving school curriculum and food patterns in the homes.

Results from appraisals indicated strengths and weaknesses in food habits of the boys and girls. Parents saw that children's food habits reflected family patterns of eating. They were eager to join with school personnel to improve weaknesses. It was believed that awareness of the situation revealed by the appraisals, combined with purposeful action, would improve foods habits.

The second phase was program planning. Brief comment is made on two of many situations which influenced boys and girls in food choices. Appraisals indicated low intakes of green leafy vegetables, not due to lack of funds, but lack of knowledge of nutritional needs and unfamiliarity with a wide variety of green leafy vegetables. Dr. Eugenia Whitehead, co-director of this research study, and Dr. Floride Moore, a consultant from University of Georgia, suggested ways to get acquainted with a variety of these vegetables, their values, and different ways to prepare them. Many such vegetables had never been served at home. It was natural to want to know more about them. A trip to the City Market was planned as no child in this sixth grade class had been there.

This trip afforded numerous learning situations for children, parents, and teachers. In addition to learning of the many available green leafy vegetables, they saw refrigerator cars, transport trucks, food conveyors, scales, and food stalls. They began to sense more of the problems and costs of marketing. They were given generous samples of a variety of green leafy vegetables in addition to those they purchased.

Learning situations continued as committees at school planned a salad party. Responsibilities of preparing vegetables and salad dressing, serving, and other activities were shared.

A seventh grade teacher learned that only about one-fourth of her pupils had eaten in a cafeteria. Yet they would be eighth graders next year, expected to select lunches in school cafeterias. Plans were made to improve the situation.

A summary of activities indicates those preceding and included in a trip to a public cafeteria. Money had to be earned and saved for the trip. Using colorful food models, values of foods were studied to learn to make wise selections in nutrition and economy. Personal appearance, social behavior, and safety became more meaningful as the trip date approached.

No casual observer would have known this was the first such trip for nearly thirty boys and girls, so adequate had been their preparation for it. Later, they suggested that several trips be arranged next year for seventh graders to prepare them to select food wisely and quickly in cafeterias used by eighth graders.

This research study in nutrition education has been planned for a three-year period, ending during 1955. It includes about 400 boys and girls in research study and control schools.

The study is designed to develop a program in sixth and seventh grades to improve the food habits of pupils. It is planned on a three-fold basis: exploration, development, evaluations. Appraisals are given in October and May.

The research study maintains desirable relationship and balance with all curricular activities. The classroom teacher is responsible for these, including health education. Nutrition is recognized as an important area of health.

Based upon data to present time, it is believed that curriculum materials and methods of teaching nutrition in these sixth and seventh grades will be helpful to classroom teachers and administrators. It is also believed that many parents as well as boys and girls will improve their food habits.

## AN ADVENTURE IN TEACHING HEALTH AND NUTRITION

*By Ruth L. Roche, Supervisor of Intermediate Grades The Board of Education, Salt Lake City, Utah*

This adventure began two years ago when a fourth grade teacher wanted to improve the instruction she was giving in health. Our conference with a community resource nutritionist centered around the concept of "learning by doing" rather than just talking and reading about health and nutrition. An idea took fire. Why not a portable kitchen so children might have simple experiences in using foods?

This fourth grade teacher has deep insight. Many of her pupils come from homes where mothers go to work before the children are up. Breakfast often is inadequate. She began by planning a food study with the children. To create an environment for questions, a variety of materials appeared on the bulletin board and reading table. After free study of the materials, the children suggested what they wanted to know. Even these few of their questions show many interests: Which foods are best? What foods do people in other countries eat? How are foods protected? What is a good breakfast? Are some foods better for us than others? How are we going to know how to cook different things?

Planning together is an essential of education in a democracy. Plans to find answers were shared: reading science and health books; studying pictures and special booklets; doing simple experiments with foods. The children suggested forming committees as a way to work together. Thus they began to learn self-direction, the need to make choices and share information, to work with others, to use the library. Learning how to find information is more im-

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—that your heart beats about 100,000 times a day, pushing blood through thousands of miles of blood vessels?

—that about 1/3rd of our brides and 1/4th of our mothers bearing a first child are under 20, suggesting the fundamental importance of attention to health habits of teen-age girls?

—that if each of our 30 million pupils drank ½ pint of milk daily at school, during a 180-day school year they'd use nearly four times more milk at school than they do now, even though such present use is about 360 million quarts of milk a year?

—that in Type A school lunches, milk contributes a greater portion of at least five nutrients than its portion of cost?

—that, in 1953, milk production in 47 of our 48 states exceeded that in 1952, and total production on farms exceeded any previous year, reaching 121 billion pounds, or about 56 billion quarts of milk, according to preliminary figures?

—that, per person, we use about 82 percent more cheese and 70 percent more ice cream than we did before World War II.

—that to improve breads served in school lunches, the Bureau of Human Nutrition and Home Economics has developed five bread formulas with six to ten percent milk solids, varied by use of raisins, whole-wheat and soy flours, wheat germ, and brewers' yeast?

# THINGS YOU'LL LIKE TO READ

**Biochemistry and Physiology of Nutrition.** Volumes One and Two— Edited by Geoffrey H. Bourne and George W. Kidder. New York: Academic Press, Inc. 1953. $13.00 and $15.00.

These two volumes bring together into one work a comprehensive, technical treatise from the vast research in the field of nutrition. It was written by specialists and is directed to scientists dealing with problems of metabolism as well as to the nutritionist. Noted scientists of England and the United States have contributed each segment as planned by the editors. Research scientists should find this treatise of inestimable value also in discerning gaps in knowledge which call for step by step investigation.

**Your Diabetes and How to Live With It**—Floyd L. Rogers, M.D. and Ruth M. Leverton, Ph.D. Lincoln: University of Nebraska Press. 1953. $2.50.

This revised and enlarged edition, prepared for diabetic patients, is a contribution to doctors, dietitians, and patients. Its simply expressed and practical information is divided into three sections: Doctor to Patient, Dietitian to Patient, Recipes. The Exchange Lists, ADA Diets, and recipes are those developed by joint committee of American Dietetic Association, American Diabetes Association, and Diabetes Section of U.S. Public Health Service.

ERRATUM: **A Survey of the Literature of Dental Caries,** reviewed in NUTRITION NEWS, *17*:3 (Feb.) 1954, is $3.00.

## AN ADVENTURE IN TEACHING HEALTH AND NUTRITION

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portant than memorizing facts. The committees also worked out interesting ways of reporting to the class.

From the children's reports the group learned about food and its importance in keeping healthy. Then, because of the portable kitchen, they had the opportunity of preparing and eating foods they had been studying.

More planning, more learning to apply language arts and arithmetic as well as their new awareness of foods and food choices! Before they might use this portable kitchen, they shared in planning how to learn to use it.

At the teacher's suggestion, a committee wrote to a home economics teacher of a nearby high school. So began a cooperation of rich experience for high school girls, these children, their parents, and for teachers.

Space does not permit details of the learning experiences—how proudly the food purchasing committee shopped with a parent while others asked a nurse's help in problems of cleanliness with food; how earnestly high school girls (working in pairs) participated—how they practiced to perfect skill in "how-to-do" and how to answer questions—how they minded not at all making up work missed in other classes!

Out of this first adventure the use of a portable kitchen is growing steadily. There are many adult challenges. Teachers must be interested if the experience is made worthwhile. With limited experience in home economics, with large classes, how can they be helped to feel confidence in such an adventure? How helped to sense and develop the broad educational values?

We have moved slowly—first through principals, then group conferences of interested teachers. Cooperative planning begins at each school at least a month before a portable kitchen project is to begin. Details are worked out according to needs of pupils of that school. The experiences are kept simple. The help of the high school girls gives the teachers a feeling of security in working with a large group of pupils.

As plans are made together, there are different concepts for fourth, fifth, and sixth grades. Experiences are being evaluated for incorporation into a new health guide underway.

The educational values reach far for pupils, parents, and teachers. Children have learning experiences that belong together. Reading, spelling, arithmetic share in experiences in studying problems in health and nutrition as the child feels and sees them.